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plete failure to indicate the magnification used in the figures. This makes comparisons on the part of other workers difficult or even impossible.

In spite of the exceptions taken in various respects to the work of the Anglo-Japanese authors, it must be conceded that their line of investigation is one of great promise, and it is to be hoped that they will feel encouraged to continue it with a greater attention to definiteness in anatomical characterization.—E. C. JEFFREY.

Vascular anatomy of Gleichenia.—BOODLE and HILEY,[6] from the study of the anatomy of *Gleichenia pectinata* and allied species, reach certain theoretical conclusions as to the origin of the tubular medullated stele. They report the result of the examination of the node and internode, as well as the branching stem, of certain species of *Gleichenia*, particularly *G. pectinata*. It is not surprising that they reach substantially the conclusions which have been published already by the senior author in earlier contributions. The published results in this case, however, appear to indicate a certain modification of the position originally held by BOODLE, to the effect that in all cases the pith is a part of the stele and is not derived by inclusion of the fundamental or ground tissue from outside the central cylinder; for the authors in this article use the term solenostelic, borrowed from GWYNNE-VAUGHAN and employed by him in the sense of a tubular stele with internal as well as external phloem and inclosing fundamental tissue as a pith (a meaning stated by GWYNNE-VAUGHAN himself to be equivalent to the reviewer's siphonostelic with internal phloem). Although the English writers in this instance concede apparently the arrival of the solenostelic condition as the final result of the modification of the pithless protostele, they express the opinion that the pith appears first as the result of the transformation of some of the tracheids into a central mass of parenchyma, a condition followed by the appearance of ramular gaps in the stele as the result of branching, leading to the intrusion of phloem from the outside of the stele and ultimately of the fundamental tissue itself. Only at the end of the process do the leaf gaps appear and become patent.

These views are all the more remarkable because in the same article the authors concede that the islands of parenchyma occurring in the petiolar strands of certain representatives of the Gleicheniaceae are derived from the cortex by inclusion, and were originally surrounded both by internal phloem and internal endodermis. The condition in which the included parenchyma is separated from the vascular tissues of the petiole by neither endodermis nor internal phloem is a result of progressive degeneracy. It appears almost an extreme example of the perversity of the human mind to explain the occurrence of central parenchyma in the leaf trace in a node diametrically opposite to that adopted for the appearance of a pith in the vascular tissues of the stem. If the fundamental tissues may be included in the leaf trace, there appears to be no reason why a similar process should not lead to the formation of pith in the axis. The adoption of this hypothesis, moreover, explains the appearance of included endodermis and phloem in young individuals of various examples of vascular plants, a condition which finds no elucidation whatever in connection with the views adopted almost universally by English anatomists.—E. C. JEFFREY.

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[6] BOODLE and HILEY, On the vascular structure of some species of *Gleichenia*. Annals of Botany **23**:419–432. *pl. 29*. 1909.

Jurassic woods.—GOTHAN[7] describes a number of fossil woods from the Jurassic of King Karl's Land, none of which he refers to the Araucarineae. Two species, *Phyllocladoxylon* sp. and *Xenoxylon phyllocladoides*, are considered to belong in the region of the Podocarpineae. One *Cupressinoxylon* is also figured, which is compared with the *C. McGeei* of KNOWLTON. Next are two Cedroxyla, *C. cedroides* and *C. transiens*. To the latter of these he attaches much importance because of the presence of araucarian pitting together with the ray structure of the Abietineae. The author assumes that he has to do in this instance with an abietineous wood, in which certain araucarineous characters indicate the derivation of the Abietineae from an araucarian stock, in accordance with the conventional and generally received views. It does not seem to have occurred to the author that he may have an araucarian conifer with indications of transition toward the Abietineae. The genus *Araucariopitys*, recently described by the reviewer, has the same ligneous characters as GOTHAN'S *Cedroxylon transiens*, only with a more pronounced resemblance to the Abietineae. It is nevertheless unquestionably an araucarian conifer. One abietineous wood is described, namely *Protopiceoxylon extinctum*. The wood in question has normally only horizontal resin canals, but vertical ones may occur as the result of injury. The author regards his wood as evidence that the vertical type of resin canal is older than the horizontal, forgetful that GOEPPERT and PENHALLOW have described much older Pityoxyla from the Carboniferous and Permian respectively, which show only horizontal canals. It seems, accordingly, that "*Protopiceoxylon*," with a much greater degree of probability, represents a stage in degeneracy toward the *Cedroxylon* type, rather than a primitive abietineous type antedating *Pityoxylon*. The author lightly sets aside the evidence adduced on comparative anatomical and experimental grounds by the reviewer for the great age of the pinelike Abietineae. With admirable Teutonic frankness, he characterizes the reduction hypothesis of the phylogeny of the Coniferales as one to which, "wohl niemand beipflichten kann." He apparently loses sight of the fact that the reduction hypothesis is now quite generally adopted by competent morphologists for such degenerate groups as the Equisetales, Lycopodiales, etc. Had the literature on the fossil conifers, which has recently been published by American paleobotanical writers, been available, in all probability GOTHAN'S opinion in regard to the fallacy of the reduction hypothesis in connection with the phylogenetic development of the conifers would have been expressed with considerably more reserve.—E. C. JEFFREY.

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[7] GOTHAN, W., Die Fossilen Hoelzer Koenig Karls Land. Handl. Kgl. Svensk. Vetensk.-Akad. **42**: no. 10.